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Human security and climate change mitigation: The case of ocean governance

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ABSTRACT

This paper focuses on the relationship of climate change mitigation and human security and its implications for ocean governance. The analysis of the existing maritime climate change mitigation landscape begins with a mapping of the different actors involved and their empowerment in this domain. This is followed by a presentation of the institutional framework for maritime climate change mitigation, moving from the international to the EU level, with a special focus on the Baltic Sea, which is highlighted as an example of a regional sea environmental system that has incorporated climate change mitigation in its objectives and operational actions within the broader aim of securability. Finally, the prevailing and emerging norms in the domain of maritime climate change mitigation efforts at the international and regional levels are being discussed.

1. Introduction

Ocean governance, as part of the broader concept of global governance introduced by the Commission on Global Governance in 1995, consists of all the complex multilevel relations and processes through which 'individuals and institutions, public and private' attempt to manage maritime affairs, accommodate diverse interests and cooperate through formal or informal arrangements.[1] Ocean governance unfolds within different policy contexts. Climate change is placed high on the agenda of contemporary maritime governance regimes. The reasons for the prioritization of climate change issues in global and regional maritime affairs are several. The most evident one is related to the impact of climate change on biological and natural processes and its evolving or estimated outcomes: ocean acidification, ocean warming and sea-level rising. Still, the relationship between ocean governance and climate change comprises other sets of challenges that transcend the traditional perception of environmental affairs, bringing to the fore the social, economic, political and cultural implications of climate destabilisation [2].

In this context, climate change and its consequences are considered as a main cause of human insecurity [3] that need to be addressed in a comprehensive manner at different levels of governance and within different sectoral policies. Climate change challenges require rapid operational responses and changes in the mentality of policy making and economic structures on behalf of both international institutions, states and non-state actors.

This paper focuses on the implications of climate change mitigation on ocean governance through the lens of the human security approach. In spite of the fact that most studies focus on climate change adaptation initiatives as a response to human security challenges [3], this paper will attempt to highlight the relationship of the different components of human security to climate change mitigation efforts within the framework of ocean governance.

2. The securitization of climate change debate

Climate stability is nowadays perceived as a component of international security. A decade ago, the Security Council incorporated climate change in its agenda focusing on its security implications, 'including (its) impact on potential drivers of conflict, such as access to

Abbreviations: AF, Adaptation Fund; CDRRC, Common but differentiated responsibility and respective capabilities; COP, Conference of the Parties; ECA, Emission control area; ETS, Emissions Trading Scheme; GCF, Green Climate Fund; GHG, Greenhouse gas; HELCOM, Baltic Marine Environment Protection Commission, Helsinki Commission; IMO, International Maritime Organization; ISO, International Organization for Standardization; IUCN, International Union for Conservation of Nature; JRC, European Commission's Joint Research Centre; LDCF, Least Developed Countries Fund; MARPOL, International Convention for the Prevention of Pollution from Ships; MEPC, IMO's Marine Environment Protection Committee; MSFD, Marine Strategy Framework Directive; NOX, Nitrogen oxide; PSF, Project Support Facility; SCCF, Special Climate Change Fund; UNCLOS, United Nations Convention on the Law of the Sea; UNFCCC, United Nations Framework Convention on Climate Change; WFD, Water Framework Directive; WSC, World Shipping Council; WWF, World Wildlife Fund

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[1] Based on the definition of global governance provided by Commission on Global Governance, *Our Global Neighborhood* [1].

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energy, water, food and other scarce resources; population movements; and border disputes' [4–6], followed by the European Union which recognized this multifaceted challenge as a 'threat multiplier which exacerbates existing trends, tensions and instability' and called for comprehensive solutions 'in line with the concept of human security' [7, p. 2].

Two dimensions of security should be discerned at this point. The concept of inter or intra state security, in the cases of regional or internal destabilization due to migratory pressures, competition for access to natural resources, or questioning the geopolitical status quo: claims of states to extend their continental shelf in areas that were inaccessible in the past, as in the case of Russia in the Arctic region, is an illustrative example of a claim that was triggered by climate change impacts. The proliferation of localized conflicts due to climate variability (along with other factors) is also an issue of growing attention (and often disagreement) in security studies literature, especially in Africa [3]. Moreover, climate change poses risks to states' 'vital systems security' that is their critical infrastructure including energy, water and food production and supply as well as transport/communication infrastructure, rendering them more vulnerable in terms of the state apparatus capacities linked to national security [8].

The second dimension of climate change securitization makes a shift from the conventional sovereign or territorial perception of security towards a human centered one [9, p. 5]: the human security concept. According to the United Nations, human security is related to a number of 'widespread and cross-cutting threats facing Governments' regarding 'the survival, livelihood and dignity of their people' [3,10]. Thus, human security transcends the traditional, state-centric perception of security related to the threat or use of military might or the risks posed to states' vital infrastructure as a component of its power and focuses on the 'security of the individuals, their protection and empowerment' [11, p. 5]. Threats to human security encompass a wide range of topics from economic and political insecurity to limited access to food, degradation of human environment and personal security [11, p. 5,12]. Climate change is recognized as a potential enabler of all the above-mentioned threats [3,8,12].

In the case of ocean governance, changes in patterns of economic activities including reallocation of fisheries activities or opening of new maritime transport routes due to climate alterations may affect local communities and nations welfare, economic prospects and their social cohesion, accentuate natural phenomena such as fishing stocks deprivation and acceleration of ice-melting. Sea-level rise and degradation of vital resources for maritime and coastal communities and populations may contribute to the broader phenomenon of environmental migration [13] altering the world's human and cultural geography if preventive action does not take place.

There is a wide consensus on the basic framework through which human security challenges should be addressed. According to the United Nations Secretary General's 2009 Report 'human security calls for comprehensive, people-centered, context-specific and prevention-oriented actions that help to improve the capacities of Governments and people to provide early warning, identify root causes and address policy gaps with regard to current and emerging challenges' [14].

Although the relation of human security to climate change is mainly focused on adaptation policies, reference to comprehensive actions and prevention is inextricably linked to climate change mitigation and the notion of 'securability' that is Governments' as well as 'people's ability to contribute to their own security' [15]. However, the ability to act requires financial capacity, expertise, political commitment, empowerment of different actors and effective institutions at the international and national levels that ensure this participatory venture.

In the following sections the concept of climate change securability will be tested in the domain of ocean governance. Responses to human security threats in this highly fragmented (from an institutional point of view) domain rely on the implementation of comprehensive preventive solutions. The main tools towards this aim are (a) the adoption of protection measures, which is generally considered a top-down process including standard setting processes at the international, regional and national levels and (b) the empowerment of individuals, communities, non-states entities and states (either individually or in groups), a bottom-up approach, first of all by ensuring the protection of their rights as well as by perceiving them as agents of policy formulation and implementation [11, p. 12]. In this context, global, regional and sub-regional climate change mitigation efforts in different maritime governance regimes will be examined not solely from the point of view of GHG emissions reduction, but also taking into account other initiatives that contribute to more comprehensive human security-oriented approaches to this challenge.

The analysis of the existing maritime climate change mitigation landscape begins with a mapping of different actors involved in contemporary governance of climate change mitigation in maritime affairs in order to discern the empowerment of different actors. The paper continues with a presentation of the institutional framework for maritime climate change mitigation, moving from the international to the EU level, with a special focus on the Baltic Sea. More specifically, the existing institutional acquis will be analyzed in relation to (a) general protection measures adopted to enhance marine environmental resilience as a basic component of mitigation; (b) the GHG emissions reduction measures; and (c) the financial dimensions of maritime climate change mitigation. Last but not least, the prevailing and emerging norms in the domain of maritime climate change mitigation efforts are being discussed.

3. Climate change mitigation and the actors involved in ocean governance

Ocean governance architecture related to climate change mitigation appears to be highly fragmented in terms of membership; multilevel, since it comprises different layers of competence and institutional forms [16, p. 21]; and decentralized, since there is no unitary authority with comprehensive competences in this domain. Additionally, the functionalist model of international cooperation has been eroded by what has been characterized as transnational climate governance and the empowerment of actors mainly related to the market or science [17].

Departing from the traditional separation of state and non-state actors in international relations, it seems that the role of states remains focal in terms of addressing climate change human security challenges mainly by adhering to international agreements as well as implementing the obligations undertaken. Climate change mitigation is related to different perceptions and functions of states, from sovereignty-focused (e.g. Trump administration's approach)[2] to the expansion of a country's green public diplomacy to encompass security challenges (e.g. Macron's vision concerning France's policy vis à vis Europe [19]) and the Baltic Sea countries cooperation culture in the environmental and political domain (e.g. the inclusion of climate change in the agenda of the Council of the Baltic Sea States [20]).

Non-state actors also constitute a significant pool of agents who shape the general and more specialized institutional and policy frameworks for climate change mitigation efforts in view of addressing human security threats. International organizations such as the UN, IMO [21], UNESCO [22], the World Bank [23], IMF [24] and WTO [25] are significant actors in this domain since they all have incorporated the maritime dimension of climate change mitigation in their agendas in line with their competences and their objectives (whether normative oriented or project-based). They provide the political and institutional environment for deliberations and decision-making, dispute resolution mechanisms, technical expertise in specialized issues such as maritime

[2] Reference is made to US government's decision to withdraw from the Paris Agreement [18].

safety or environmental standards, marine research, change of economy patterns, protection of underwater cultural heritage etc. At the regional level, the case of the European Union's climate change acquis as well as the legislation in other related policy domains combine all the above-mentioned functions (normative, project-based financial redistribution schemes, including an advanced judiciary mechanism).

The institutional mechanisms of climate change international instruments, although not enjoying the legal autonomy of international organizations constitute decisive factors for the promotion of principles, realization of commitments, day-to-day management as well as for the evolution (through monitoring, assessment and deliberations among state parties) of the different legal regimes. The case of the United Nations Framework Convention on Climate Change (UNFCCC) with its secretariat and the Conference of the Parties (COP) as well as its subsidiary organs and their contribution to the evolution of its institutional architecture is illustrative. At the sub-regional level, the Helsinki Convention's Commission (HELCOM) transcends the conventional monitoring role of such organs and takes up the role of policy maker, through the continuous policy reorientation and the adaption of the Convention's objectives to related challenges (such as climate change mitigation).

What is interesting is the proliferation of entities that have not resulted from intergovernmental initiatives such as multilateral agreements including NGOs and the private sector.

The role of NGOs is associated to the emergence of transnational models of governance in the academic literature [26], mainly through the following channels: (a) through the provision of expertise (e.g. IUCN, WWF etc.) to international organizations/instruments or competent national authorities, (b) the mobilization of public opinion, or (c) the exertion of pressure on traditional political agents at the international, regional, sub-regional levels through participation in consultations or in the form of environmental activism (e.g. Greenpeace). NGOs actions are oriented towards the protection of natural resources (in our case, those resources related to climate change mitigation in maritime affairs) which are perceived as fundamental public goods. In this context their contribution aims at the generation and diffusion of behavioral patterns for the protection of public goods or the adoption, implementation and evolution of international public policies by competent authorities.

Transnational models of governance are, however, mostly related to the practice of private governance schemes or 'private transnational regulatory organizations' [27], that is, market driven self-regulation processes in the environmental domain [28]. International Organization for Standardization (ISO) 14,000 family of environmental management standards, include the following areas related to climate change mitigation: environmental management, greenhouse gas management and related activities as well as measuring the carbon footprint of products [29]. The World Shipping Council (WSC) and its member companies work, among other, towards the adoption of new international standards for ships and the reduction of air emissions from ships [30].

At the regional level, the unifying impact of EU legislation and the multilevel processes of the organization's climate change policy constitute a unique model that transcends the above-mentioned hybrid public-private governance schemes, since it is based on a complex set of formal and informal channels of communication, decision-making and assessment processes.

At the sub-regional level, the example of the Baltic Sea region marine governance scheme, including institutions and stakeholders, constitutes one of the most advanced models in terms of multilevel and multi agent participation in policy adaptation, operationalization (through pilot projects) and contribution to the international climate change mitigation agenda. The governance structure of the Helsinki Convention and the EU Strategy for the Baltic Sea Region (EUSBSR) are illustrative examples of broader regional public participation processes in this domain [31,32]. Climate change (mitigation) is also included in the agenda of the Council of the Baltic Sea States, the political forum consisting of 11 states[3] and a representative of the European Union. The Council promotes the implementation of global goals and commitments including the Sustainable Development Goals and the Paris Agreement at the regional level, through concrete actions in the field.

It should be mentioned that there are no dividing lines among these different types of governance or crystalized hierarchical relations, although states and international organizations prevail due to their function as institutions exercising public authority. However, the dividing lines between the impact of public authority institutions and the processes generated by actors mobilized through non-governmental environmental, social or economic driven channels seem to be blurred. In general, the role of civil society and economic agents is recognized (often officially) and their positions may be pursued by public authority institutions. Non-governmental agents are more flexible and very often one step ahead in relation to the evolving scientific, technical or economic realities so they frequently constitute a sine qua non for the implementation of policy goals and legal objectives set by states or international organizations.

4. The institutional framework: mitigation of climate change in ocean governance through protection

According to UNEP climate change mitigation 'refers to efforts to reduce or prevent emission of greenhouse gases … [mainly aiming at the implementation of] climate resilient and low emission strategies' [33]. As already mentioned, the institutional landscape of climate change mitigation related to the marine space is fragmented, multilevel and it is characterized by different levels of legalization. Legalization is defined as the 'particular form of institutionalization, characterized by three components: obligation, precision and delegation' [34, p. 401]. These dimensions do not appear in a uniform way[4]; notwithstanding the legal character of institutionalization processes, it should be mentioned that all instruments have a functional and a social dimension since they 'prescribe behavioral roles, constrain activity and shape expectations' [35, p. 59] of the actors involved.

4.1. General framework: linking climate change mitigation to good environmental status and efficient management

Climate change mitigation efforts taking place within the governance framework of ocean affairs depart from the protection and conservation of the marine environment to enhance its resilience. This process entails the sustainable use of natural resources and the promotion of marine scientific research as a tool towards these aims. The United Nations Convention on the Law of the Sea (UNCLOS) does not mention climate change, however, it provides the general framework for marine environmental protection as well as for marine scientific research [36,37].[5] Moving to the specialized legal instrument on climate change, UNFCCC introduces the obligation to its parties 'to promote sustainable management and promote and cooperate in the

[3] Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Norway, Poland, Russia and Sweden.

[4] Obligation ranges from 'expressly non-legal norms to binding rules', precision from 'vague principles to precise, highly elaborated rules' and delegation from 'diplomacy to international courts, organization and domestic application of rules' [34, p. 404].

[5] Part XII of the 1982 Convention introduces a general obligation for the protection of the marine environment in article 192 and more specific provisions for states to 'prevent, reduce and control pollution of the marine environment from any source' [36, Art. 194.1] and not cause damage by activities under their jurisdiction to other states [36, Art. 194.2]. Part XIII follows the same pattern with article 239 setting a general obligation for the promotion of marine scientific research according to certain general principles including its conduct for peaceful purposes [36, Art. 240].

conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems' [38, Art. 4]. Marine research and knowledge of the state of the seas and oceans is also a priority. Scientific cooperation of states within the framework of UNESCO's Intergovernmental Oceanographic Commission supports the action undertaken by UNFCCC by providing data and contributing to the creation of policy tools in the domain of maritime and coastal management [22].

The Sustainable Development Goals, adopted by the United Nations General Assembly in 2015, include climate change among the issue areas 'of critical importance for humanity and the planet' [39, preamble p. 2]. They depict the political commitment to take urgent action [39, goal 13] while setting forth the conservation and sustainable use of the oceans, seas and marine resources as a separate goal [39, goal 14]. Goal 13 refers to global climate change mitigation efforts with a special emphasis on the most vulnerable members of the international community, mainly through the promotion of 'mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States' [39, target 13.b]. Goal 14 comprises targets for the sustainable use and protection of the marine environment and its resources in order to enhance its resilience targets [39, target 14.2 and 14.c], while it also calls for the '(i)ncrease of scientific knowledge, (the) develop(ment of the) research capacity and (the) transfer (of) marine technology (…) in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries' [39, target 14.a].

The new Paris Agreement, leaving aside the greenhouse emissions mechanism it introduces (see Section 4.2), also promotes comprehensive solutions vis à vis non market mitigation efforts in the context of sustainable development, namely, it reiterates 'the importance of the adoption of integrated, holistic and balanced approaches' catering among other for national mitigation efforts [40, Art. 6(8)]. It gives the Parties the discretion to develop their own national plans in accordance to the differentiated environmental, social and economic realities pertaining in every State. Moreover, the 2015 Agreement endorses the UNCCC commitments concerning technology transfer, recognizing the significance of technology development and transfer in relation to climate change resilience and the reduction of greenhouse gas emissions (without excluding the transfer of technology between developed states) through the Technology Transfer Mechanism which prioritizes the assistance to developing states [40, Art. 10,41].

At the EU level, the Marine Strategy Framework Directive (MSFD) [42] sets the framework for member states to achieve and maintain good environmental status in their marine waters by the year 2020 at the latest. According to MSFD, its principal aim is to enhance the environmental endurance of the marine ecosystems in Europe in order to counterbalance the effects of global climate change. Its spatial application is complemented by the Water Framework Directive (WFD) [43] that establishes the regulatory framework for the protection, apart from inland surface waters and groundwater, of transitional and coastal waters,[6] ensuring in that way the sound management of land/sea water interaction to prevent and address climate change impacts in a comprehensive way.

European maritime governance system has also prioritized the enhancement of the knowledge of the seas and the oceans and the collection of reliable data in relation to their environmental status. Climate change was one of the crosscutting thematic pillars of the European Strategy for Marine and Maritime Research published in 2008 [44]. This Strategy aimed at the promotion of interdisciplinary research to enhance detection and better assessment of the impacts of climate change on the marine coastal environment. The establishment of a European Marine Observation and Data Network [45], has contributed to the establishment of Europe's data infrastructure, ensuring interoperability of research and data collection mechanisms as well as an interdisciplinary approach in order to support integrated solutions in the different fields of maritime governance. The EU Research Policy through the European Commission's Joint Research Centre (JRC) promotes, inter alia, research related to climate change mitigation and preservation of the marine environment.

The adoption of Directive 2014/89/EU establishing a framework for maritime spatial planning introduces the obligation for member states to furnish maritime spatial plans by 2021 [46]. According to the Directive, through their maritime spatial plans, member states shall aim to contribute to the sustainable development of energy sectors at sea, of maritime transport, of the fisheries and aquaculture sectors, and to the preservation, protection and improvement of the environment, including resilience to climate change impacts [46, Art. 5(2)].

At the Baltic Sea region, the protection of the Baltic Sea marine environment is structured around the Helsinki Convention institutions, mainly the Helsinki Commission (HELCOM). HELCOM has worked on the adjustment of global climate change mitigation efforts at many levels of its regional action. First of all, in terms of assessment processes, it has published two reports on Climate Change Assessment in the Baltic Sea Area (2007, 2013) [47,48]. Secondly, it implements the Baltic Sea Action Plan [49] for the restoration of good ecological status of the Baltic marine environment. The Plan was adopted in 2007 by the Baltic States and the EU and is regularly updated, along with the renewal of the political commitment of the participating countries [50]. Climate change mitigation, apart from the general goal of good environmental status that would enhance resilience of the ecosystem which can 'optimally contribute to mitigation of global climate change' [49], is incorporated in the Plan's target for maritime activities. The Plan considers the realization of maritime activities in an environmental friendly way as a crucial prerequisite for the achievement of good environmental status. Thirdly, HELCOM has compiled a set of proposals on climate change impacts mitigation in 2017 as a contribution to the report of the Secretary-General on oceans and the law of the sea [51]. These proposals include the incorporation of climate change impacts into HELCOM targets and measures (including issues such as eutrophication reduction and planning measures), the decrease of human pressures to mitigate climate change impacts on biodiversity (making reference to the enhancement of relevant knowledge), the enhancement of good environmental condition and subsequently marine environmental resilience (through the establishment of ecologically coherent networks of marine protected areas), the development and maintenance of marine monitoring and data assimilation and enhancement of research in this domain and the adoption of a comprehensive approach vis à vis the different sectoral policies as well as the communication between science and policy.

4.2. Climate change mitigation and GHG emissions regulation at the maritime sector

The Paris Agreement establishes a new 'mechanism for the mitigation of greenhouse emissions (…)' [40, Art. 6] to hold 'the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change' [40, Art. 2]. While the Agreement sets concrete objectives, following a traditional top-down approach [52, p. 25], it leaves the specification of the nationally determined contributions to the discretion of the parties. This bottom-up

[6] According to the Water Directive, 'coastal water' means 'surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters'.

approach [52, p. 25] has a dual effect. On the one hand it does not put excessive pressure on governments in terms of the content of the measures to be adopted resulting in the high numbers of adherence to the Agreement. One the other hand, making no reference to the contribution of specific policy domains, such as shipping for example, leaves space for maneuver to advocates of specific interests to pursue their objectives through lobbying and exerting political pressure on governments to exclude certain activities from the above-mentioned mechanism. Since the Paris Agreement does not make any specific reference to shipping in relation to the nationally determined contributions and pending the adoption of more specific guidelines for its implementation,[7] air emissions from ships are regulated under Annex VI of the MARPOL Convention on the Prevention of Air Pollution from Ships (applying on 95.4% of the worlds' shipping tonnage). In April 2018 IMO's Marine Environment Protection Committee (MEPC) adopted an initial strategy for the reduction of greenhouse gas emissions from ships [53]. The objective of this decision is to contribute to international efforts, including the Paris Agreement and the United Nations Agenda 2030, by reducing the total annual GHG emissions by at least 50% by 2050 compared to 2008. Follow-up actions to the initial strategy will be further discussed later in 2018. Additionally, during its 71st session MEPC has amended MARPOL Annex VI, designating the North Sea and the Baltic Sea as emission control areas (ECAs) for nitrogen oxides (NOx), which act as indirect GHG [54], under regulation 13 of MARPOL Annex VI. These amendments which are anticipated to significantly reduce emissions of NOx from international shipping in the region will be implemented by 2021 [55].

At the regional level, EU has adhered to the Paris Agreement [as provided in 40, Art. 20, 56] but has also in force a very detailed corpus of secondary legislation establishing an EU Emissions Trading Scheme (based on the ETS Directive) [57]. The European Commission and the European Parliament have reached an agreement on the revision of the ETS Directive in order to adopt its legislation to the EU commitments under the Paris Agreement to reduce greenhouse gas emissions by at least 40% by 2030 [58].

While emissions from maritime transport were initially excluded from the integrated maritime policy provisions in the European Commission's Blue Paper of 2007 due to the reactions of the shipping sector [59], the European Commission in its Communication on climate and energy policy for the period 2020–2030 published in 2014 proposed the incorporation of maritime emissions in the EU's greenhouse gas reduction policies and the need to streamline the organization's efforts with those of the International Maritime Organization (IMO) [60, p. 14]. However, only modest legislation was introduced in 2015 with the adoption of Regulation 2015/757 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport. The adoption of IMO's initial strategy on the reduction of greenhouse emissions from ships had both European Commission's and Parliament's support, solving the political dead-end in introducing relevant legislation solely at the EU level.

4.3. Financing climate change mitigation in the maritime sector

Policies supporting climate change mitigation including the realization of the goals set out in the Paris Agreement require comprehensive responses at the national level, including the adaptation of national economies through the increase of low carbon infrastructure investments, change of production schemes and entrepreneurial culture [see [61, p. vi]]. This shift is not an easy task, especially for developing or least developed countries. The first challenge to be addressed is the cost of this transition both in terms of project-based activities (according to the World Bank, a smooth transition to 'low carbon, resilient global economy' amounts to 90 trillion dollars only for infrastructure mainly for developing and middle income countries over the next 15 years) [62]. The second crucial point to be addressed is catering for the side effects of such a transition that are related to economic and social cohesion. Although this shift is anticipated to create opportunities for economic development [62] from investments or energy efficiency as well as for peoples' welfare (employment opportunities or cleaner environment) there is a critical issue for the effective implementation of this change: the need for expertise and technical capacity in order to deliver the expected outcomes.

In view of addressing these challenges, apart from the general framework of assistance for developing states provided by UNCLOS,[8] the maritime sector may profit from the existing climate change financial regime, which is also multilevel and decentralized [63]. More specifically, UNFCCC has established a Financial Mechanism to provide assistance to developing state parties leaving also an option for bilateral assistance [38, Art. 11]. This mechanism was initially activated by the Global Environmental Facility, which was further complemented by the establishment of the Special Climate Change Fund (SCCF) [64], the Least Developed Countries Fund (LDCF) [65], the Green Climate Fund (GCF) and the Adaptation Fund (AF). With the Copenhagen Accord (and later on with the Paris Agreement), developed states have committed to mobilize US$100 billion per annum by 2020 to be used, among other, for mitigation, adaptation, technology transfer and capacity building in developing countries. In 2015 the Sustainable Development Goals stressed the need to implement this commitment 'in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the GCF through its capitalization as soon as possible' [39, target 13.a]. GCF mitigation projects currently implemented support among other maritime related climate mitigation efforts taking into account human security aspects, namely 'social, economic and development co-benefits and taking a gender-sensitive approach' [66]. SCCF also funds programmes at the national level for adaptation and technology transfer that are 'integrated into national sustainable development and poverty-reduction strategies'. The eligibility of these projects depends on the fulfillment of two criteria: addressing climate change challenges 'in addition to basic development needs in vulnerable socio-economic sectors' [67]. In the case of LDCF funding, apart from the country eligibility criteria, projects should fall into one of the GCF priorities (including climate change mitigation) and provide for public involvement in the design and implementation phases [68], enhancing in this way people's ability to participate in actions affecting their security.

The 2015 Paris Agreement also emphasizes the close interrelation of mitigation efforts to adaptation measures to be needed and the cost of the latter [40, Art. 7]. It also provides for the obligation of developed countries that have adhered to it to financially '… assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention' [40, Art. 9]. The same goes for the technological development and support of mitigation efforts through cooperative action [40, Art. 10], with special emphasis on the least developed countries or the countries 'that are particularly vulnerable to the adverse effects of climate change' [40, Art. 11].

At the regional level, the European Union finances projects related to climate change mitigation under its structural and investment funds (with a budget of 23 billion euros for the implementation of the

[7] The Paris Agreement Rulebook will be finalized by December 2018 and is expected to be adopted in during COP24 in Katowice, Poland.

[8] In terms of marine environmental protection and conservation, UNCLOS provides for technical and preferential assistance for developing states (in terms of the allocation of appropriate funds and technical assistance; and the utilization of specialized services by international organizations) [36, Arts. 202–203], while it also provides for the development and transfer of marine science and technology 'on fair and reasonable terms and conditions' [36, Art. 266].

Thematic Objective "Shift to low-carbon economy") [60, p. 16] and HORIZON (close to €6 billion will be dedicated to energy efficiency and to secure, clean and low carbon technologies) [60, p. 15] programmes, in the domains of marine research, research and development, energy [60, p. 6], carbon capture and storage, maritime spatial planning, and Small and Medium Sized Enterprises (SMEs).

The Baltic Sea region was the first maritime macro-region within the framework of the European Union established in 2009. According to the definition provided by the European Commission, a macro-region is 'an area covering a number of administrative regions but with sufficient issues in common to justify a single strategic approach' [69]. The concept of macro-regions in the EU was introduced in its regional policy agenda in order to enhance coordination of project-based initiatives funded under different European financial instruments in the same geographical region. Within this context, the EU strategy for the Baltic Sea Region (EUSBSR) published in 2009 [70], comprises four policy domains: environment; economy; energy and transport; safety and security. Sustainable development and mitigation of human induced impacts of climate change as well as adaptation to extreme weather conditions caused by climate deregulation were mainstreamed in the Strategy's policy objectives. The revised Strategy objectives of 2012 were 'Save the Sea', 'Connect the Region' and 'Increase Prosperity'. The EUSBSR follows a project-based approach. For the financial period 2007–2013, the Strategy has adopted a priority area on climate change mitigation and adaptation and seven related projects were implemented [71]. Under the 2014–2020 follow-up programme six projects focusing on climate change mitigation in the marine space are currently implemented (including promotion of R&D activities to respond to climate change challenges, measures for maritime industry, effective water management in line with HELCOM's Recommendations, renewable energy spatial planning including offshore installations and addressing specialized issues such as Baltic Sea eutrophication) [72]. Additionally, the Project Support Facility (PSF) established by the Council of the Baltic Sea States finances projects that aim at developing 'the Baltic Sea Region as a model region of sustainable societies able to manage and use resources efficiently, […] in order to ensure its prosperity, environmental protection and social cohesion' [73].

5. Climate change mitigation: the normative dimension

The normative basis of climate change mitigation efforts is founded on a series of principles initially introduced in environmental legal instruments and declarations [74], such as the precautionary principle and the principle of common but differentiated responsibility and respective capabilities. Climate change mitigation principles are also related to other domains such as human rights protection and socio-economic organization patterns. They are implemented within the broader framework of general public law principles such as good faith (in terms of implementing states obligations) and good neighborly relations (stipulated in article 2 of the UN Charter) as horizontal prerequisites of global efforts towards international cooperation vis à vis climate change mitigation.

The precautionary principle has been introduced in the environmental discourse and legislation in the 70s. However, the concept appears in different versions pending a universally agreed definition.[9] Despite this conceptual uncertainty there are certain elements that are common in the multitude of official formulations and the operational implementation of the principle: the existence of a serious risk and the need for preventive measures even when scientific uncertainty exists [75]. This is the case with the climate change regime. UNFCCC calls for 'precautionary measures' [38, Art. 3] even where '(…) lack of full scientific certainty should not be used as a reason for postponing such measures…' but their content remains elusive. This raises significant challenges for policy-makers as well as for the actors involved in the process of maritime climate change mitigation. First of all, precautionary measures are costly since they rely on innovation and change of production and energy patterns. This poses serious problems for the governments of both developed and developing states. Secondly, the introduction of precautionary measures may also have side effects on different policy sectors (e.g. employment and social security) if not adopted in a comprehensive manner. Thirdly, in order to introduce effective precautionary measures, information campaigns and transparency is required in order to achieve a minimum of societal consensus and public participation. Thus, financial and technical support to developing countries, promotion of scientific research and transparency in policy action at the international and national levels constitute the main challenges in the implementation of the precautionary principle in climate change mitigation efforts.[10]

Equity constitutes another fundamental normative pillar of the climate change regime. According to UNFCCC, '(t)he parties should protect the climate system for the benefit of humankind, on the basis of equity and in accordance with their common but differentiated responsibility and respective capabilities' (CDRRC) [38, Art. 3]. Equity is interpreted both in its synchrony (intra-generational equity) and its diachrony (intergenerational equity).

With CDRRC the responsibility of the entire international community towards climate as a common natural resource as well as the different share of responsibility related to its degradation and the action to be undertaken is recognized. However, the approach used for its implementation is far from uniform. Both UNFCCC and the Kyoto Protocol follow a classification of states in different groups, based on the developed-developing states divide, and differentiate commitments accordingly (e.g. in terms of target or timeframe differentiation or technological and financial assistance). However, implementing CDRRC on the basis of this classification, although based on the concept of historical responsibility has raised serious concerns. More specifically, the fact that countries like China and India are nowadays high on the list with GHG emitters as well as the recent global economic crisis that had an impact on many developed countries has rendered this division if not obsolete, at least questionable in terms of the traditional perception of states' capabilities [77]. The Paris Agreement attempts to address these shortcomings by introducing a new type of classification based on self-differentiation [40].[11] It actually reverses the previous classification approach from country annexing to the needs of the different policy areas to be addressed (mitigation, adaptation, emission targets, technological transfer and capacity-building, finance etc.) [52, pp. 27–30].

While intra-generational equity is addressed with the CDRRC principle and the concept of 'distributive justice', the concept of intergenerational equity is linked to the broader objective of sustainability [78] taking into account the needs of future generations in terms of environmental, economic and social perspectives [see [79, 40]]. In this context it functions more as parameter of policy orientation rather than 'an operational legal concept' [78, p. 199].

Paris Agreement also notes 'the importance for some of the concept of 'climate justice', when taking action to address climate change' (preamble). In the case of climate change mitigation, climate justice is mainly perceived as 'distributive justice' [80], since it attempts to

[9] For an elaborate account of the content and the evolution of the precautionary principle and its application to climate change law regime see J. Wiener [75].

[10] The implementation of the precautionary principle is inextricably linked to the due diligence principle that aims to 'reduce the financial, regulatory and physical risks associated with climate change' [76].

[11] The Agreement '… will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances' [40, Art. 2]. This approach is also reflected in the definition of the nationally determined contributions and (states') long-term low greenhouse gas emission development strategies [40, Art. 4].

protect the interests of groups, communities or nations that are not responsible for the environmental degradation that led to climate change. What is undermined in the climate change regime, with the exception of the eligibility criteria of certain funds, is the dimension of 'procedural justice' [80], that is connected to enhanced public engagement (e.g. public participation in policy decision-making and implementation, incorporation of traditional values and knowledge in climate change mitigation policies etc.). Additionally, although international instruments attempt to balance market-based incentives and climate change mitigation efforts, reference to the concept of climate justice implies a need to change or at least re-assess the neo-liberal approach to economic activity and empowers those groups whose interests would be very difficult if not impossible to take into account (e.g. indigenous peoples).

Finally, climate justice is inextricably linked to the protection of human rights. The threats posed to the latter in relation to climate change are twofold. On the one hand, climate change undermines individual or collective rights to health, natural resources such as water and food or safe housing, cultural identity [81]. It is also associated with more traditional dimensions of human security such as the creation of frictions among states due to the scarcity of natural resources and humanitarian crises due to migration, poverty and regional tensions. On the other hand, mitigation and adaptation measures may also adversely affect the enjoyment of human rights, including massive resettlement plans, reductions in social policy measures, and alteration of traditional agricultural methods for the sake of bio-fuels production [82].

Human rights mainstreaming in global and national climate change initiatives and action by enhancing transparency, accountability and participatory decision-making constitutes the basis for the implementation of climate justice. In this domain, the UN institutions and human rights treaty-bodies have a significant role to play. Additionally, the systematic integration of the human rights dimension in climate change related projects by UN agencies and specialized organizations is crucial towards this aim.

Beyond the normative and operational aspects of climate justice, there is one dimension that should be further highlighted: the concept of solidarity for the preservation of a global good such as climate. Solidarity is linked to the social dimension of international cooperation and the mobilization of different actors within the framework of a new kind of climate social contract based on operational perceptions of climate justice. Advanced systems of cooperation such as the case of the Baltic Sea climate change governance system may contribute towards this aim, not only via the realization of international quantitative commitments but also by transfer of financial resources and know-how to developing countries, either through individual ventures as in the case of Finland [83] or Sweden [84], or through regional institutional arrangements such as the Nordic Development Fund [85], the financial institution for the implementation of the international development policy of Denmark, Finland, Iceland, Norway and Sweden that finances, among other climate change mitigation projects in low income countries. Last but not least, the inclusion of other human security issues such as migration and forced displacement due to environmental causes in the legislation of certain Nordic countries[12] may also provide the point of departure for a future 'concerted' response for this issue in the region, enhancing the comprehensive approach vis à vis climate change challenges.

6. Conclusions

Although climate change adaptation has gained more attention within the framework of ocean governance, mitigation efforts and their contribution in addressing human insecurity are equally significant. Having examined climate change mitigation efforts within a fragmented and multilevel ocean governance framework, the following points should be highlighted.

First of all, the cohabitation of states and non-state actors in the domain of climate change mitigation in view of achieving human security is not an easy one. In the case of states, it is evident that not all states enjoy the same degree of empowerment. The latter depends not only on states' economic profile but also on their vulnerability in terms of climate change impacts. Moreover, developing synergies among different actors has proved to be quite effective in terms of standard-setting, implementation and operationalization, monitoring and assessment processes, since highly specialized services and knowledge as well as private sector involvement are required in these processes. This new governance saga however did not prevent different kinds of antagonisms and power (dis)equilibria to come to the fore. These are nurtured by different political and economic interests that result in shifts in policy orientations within the ocean climate change mitigation regime. The first issue to be tackled is related to the legitimization of this broad participation governance model and the 'gray' zones of public and private actors' participation in decision-making processes. The second issue is related to the lacuna in the inter-institutional cooperation. Inter-institutional cooperation should be further enhanced. In this context, human rights mainstreaming should be prioritized to avoid marginalization of vulnerable groups and communities or fragile states. Additionally, apart from the social dimensions of climate change, the issues of coordination of efforts among environmental and economic institutions are brought to the fore. The development of synergies and common standards among institutions of the climate change financial regime comes up more frequently than in the past both by academics as well by the institutions themselves [63, p. 89]. The need for complementarity is not restricted to the core climate change financial mechanisms but also to 'other relevant bilateral, regional and global funding mechanisms and institutions,' as mentioned in the GCF Governing instrument [66]. This could lead to a more comprehensive perception of climate change mitigation efforts, including more systematic coordination with other international institutions such as WTO or IMF in their field of competence in order to prevent flaws in global efforts towards this end. It should be mentioned however, that effective operationalization of international commitments at the regional level and the interlinkage of regional to global action do not depend solely on the financial capacities of the actors involved but there is a need for knowledge and good practice sharing among different maritime regions in order to enhance the non-market dimensions of climate change mitigation efforts.

Taking into account the above-mentioned challenges, the Baltic Sea governance scheme provides a useful model for other maritime regions since it comprises two essential elements: multilevel political commitment and effective institutional framework concerning the 'contribution of the Baltic Sea to international commitments in the field of environmental policy including climate change policy' [50]. There are several factors that have contributed to this achievement. First of all, the long established environmental cooperation within the framework of the Helsinki Convention has led to the construction of a solid 'environmental' political culture that transcends different levels of governance and different actors or stakeholders. Secondly, the legal uniformity of EU law has also created a common understanding of climate change challenges and obligations, considering that the majority of the Baltic States are EU members (with the exception of the Russian Federation). Thirdly, the existence of a common multilevel working culture: apart from the legal dimensions of Baltic Sea regional cooperation as well as the impact of EU law, the operationalization of regional objectives is achieved through transboundary projects and the development of financial synergies as in the case of projects funded by a combination of sources such as EU and regional instruments but also by national budgets.[13]

[12] In relation to temporary protection of environmentally displaced persons in Finland and Sweden. Denmark has also granted 'humanitarian status' to persons falling into this category and their families on an *ad hoc* basis [see [86, p. 47]].

[13] The latest Assessment Report of the state of the Baltic Sea (its first version was released in 2017) was funded by HELCOM, the EU co-financed projects BalticBOOST, TAPAS and SPICE (coordinated by HELCOM) as well as by Sweden, Finland, Germany and Denmark [87].

Transferring and adapting the above mentioned good practices to the needs of other regional seas may contribute to better levels of actors' empowerment for participation in decision-making and efficient allocation of financial resources on a project based-basis, enhancing significant dimensions of the notion of climate justice in maritime affairs.

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